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## DEVICE FOR PRODUCING FOAMED SCLEROSING AGENT

### PURPOSE OF THE INVENTION

The invention which concerns us here relates to a device for producing foamed sclerosing agent from liquid sclerosing agents, with the aim of simplifying this type of device.

Foamed sclerosing agent is used in the treatment of varices, into which it is injected.

### DESCRIPTION OF THE INVENTION

The device of the invention for producing foamed sclerosing agent is characterised in that it includes a container in which the sclerosing liquid used for producing the foamed sclerosing agent is deposited.

The container is provided with connection means to a propellant gas source, such means being preferably situated in its base.

In addition, the container is hermetically closed by a head piece in which a small diameter probe tube is inserted, said tube extending inside the container.

Meeting the extremity of the probe tube inside the head piece, a valve is provided whose actuation brings the outlet of the probe tube into communication with an outlet nozzle provided in the head piece, thus permitting the application of foamed sclerosing agent.

To obtain this functionality, gas is injected into the interior of the container to a determined pressure, so that when the valve is actuated an outflow of foamed sclerosing agent is produced through the outlet nozzle via the probe tube, which reduces the outflow pressure.

Advantageously, the valve is constituted by a spring-assisted piston rod extending transversely inside the head piece from which it protrudes, its extremity being provided with a push button. In addition, the piston rod is provided with two

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perimetrical grooves, both containing toric seals, between which the outlet of the probe tube is situated, so that when the push button is pressed the outlet of the probe tube is released, so allowing the passage of foamed sclerosing agent from the probe tube to the outlet in the head piece.

After actuating the push button and allowing the outflow of foamed sclerosing agent, the latter is prevented from escaping to the exterior via the housing of the piston rod by means of a third toric seal situated in a third perimetrical groove of the piston rod, which prevents the escape of the foamed sclerosing agent.

Evidently, the valve may be implemented by any type of closing device capable of manual actuation.

The means for connecting the container to a propellant gas source is constituted by a Racor quick connector or a threaded connector for direct connection.

To facilitate a clearer comprehension of this descriptive note, and forming an integral part hereof, a series of figures is attached, representing the subject of the invention in a purely illustrative and non-limitative manner.

#### BRIEF DESCRIPTION OF FIGURES

**Figure 1.**- Shows a perspective view of a possible example of the realisation of the invention.

**Figure 2.**- Shows a bottom view of the device depicted in the previous figure for producing foamed sclerosing agent.

**Figure 3.**- Shows a cross-sectional view of the device of the invention, to show clearly the internal structure of the device of the invention.

#### DESCRIPTION OF THE PREFERRED FORM OF REALISATION

There follows a description of the invention based on the figures mentioned above.

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The device of the invention for producing foamed sclerosing agent includes a container 1 and a head piece 2 in which is inserted by threaded means a probe tube 3, which by means of a conical section 4 communicates with a housing 6 of a piston rod 7.

The head piece 2 hermetically closes the container 1 by means of a toric seal 5, in such a manner that the probe tube extends along the interior of the container 1.

The piston rod is assisted by a spring 8 and includes a stop 9 which prevents it from being withdrawn from the housing.

The piston rod 7 protrudes outside the head piece 2 and is actuated by means of a push button 10.

In a preferred realisation, the piston rod 10 is detachable in that it is held in place by means of a threaded retaining cap 19 inserted in the head piece 2.

In addition, the piston rod 7 includes two toric seals 11 and 12 housed in perimetrical grooves, between which the probe tube 3 is arranged. The piston rod 7 includes a third perimetrical groove containing a third toric seal 13.

The housing 6 of the piston rod 7 communicates with an outlet nozzle 14 taking the form of an extension or neck of the head piece 2 to facilitate the connection of pipes or conventional means of distribution of the foamed product, for example a body 15 which includes a tap 16 for opening and closing the outflow of sclerosing agent to a tube 17, as will be explained subsequently.

The lower base of the container 1 includes a connector 18 for connecting a propellant gas source such as compressed air, helium, oxygen, etc.

To ensure the correct functioning of the structure described, the container 1 is opened and filled with the sclerosing liquid, and then hermetically closed with the head piece 2.

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At this stage, the propellant gas is injected into the interior of the container 1 until a determined pressure is reached, so that if under these conditions the push button 10 is actuated, overcoming the action of the spring 8, displacement of the piston rod 7 is produced and consequently displacement of the toric seals 11, 12 and 13, so that the outlet of the probe tube, instead of being situated between the two toric seals 11 and 12, is situated between the toric seals 12 and 13, thus producing connection of the outlet nozzle 14 via the housing 6, with the probe tube 3 through which the foamed sclerosing agent is impelled by the pressure existing in the interior of the container 1, such pressure being reduced by the small internal diameter of the probe tube 3 and escaping to the exterior via the outlet nozzle 14, from where it is conveyed by the tube 17 to the varice into which it is to be injected.

When the push button 10 is released, the action of the spring forces the piston rod back to its initial position in which the outlet of the probe tube 3 is situated between the toric seals 11 and 12, thus preventing the escape of the foamed sclerosing agent through the outlet nozzle 14.

In the realisation example, the probe tube 3 is lined internally with a copper tube, represented by a double trace in the sectional view of Figure 3.

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**CLAIMS:**

1.- **DEVICE FOR PRODUCING FOAMED SCLEROSING AGENT**, a preferential application for varices, characterised in that it includes a container (1) in which the sclerosing liquid is deposited; is provided with connection means (18) to a propellant gas source; is hermetically closed by a head piece (2) into which a small diameter probe tube (3) is inserted to reduce the pressure, said tube extending inside the container (1); and is closed by a valve whose actuation causes the escape of the foamed sclerosing agent via an outlet nozzle (14) provided in the head piece, all by the action of the gas.

2.- **DEVICE FOR PRODUCING FOAMED SCLEROSING AGENT**, as per Claim 1, characterised in that the valve is constituted by a piston rod (7) assisted by a spring (8), which via a housing (6) moves transversely in the head piece (2) from which it protrudes, being fitted with a push button (10); in that the piston rod (7) includes two perimetrical grooves, both containing toric seals (11 and 12) between which the probe tube (3) is situated, so that when the push button (10) is pressed the outlet of the probe tube (3) communicates with the outlet nozzle (14) via the housing (6) of the piston rod (7), so allowing the passage of foamed sclerosing agent to the outlet in the head piece.

3.- **DEVICE FOR PRODUCING FOAMED SCLEROSING AGENT**, as per Claim 2, characterised in that the piston rod (7) is provided with a third perimetrical groove housing a third toric seal (13) which prevents the escape of the foamed sclerosing agent to the exterior via the housing (6) of the piston rod (7) when the push button (10) is released.